I claim

1. A fast gamma correction method for image reading apparatus with a color correction function, comprising following steps:

a. provided that the image reading apparatus has a plurality of normalized output pixel data after correction Y quantified by n-bit into 2^n intervals, the 2^n intervals are combined to M merged interval, wherein $M \leqq 2^n$, the color correction function for the image reading apparatus is represent by a simple fitting function in each merged interval;

b. reading a normalized input pixel data X and locating which merged interval the input pixel data X lie in;

c. finding the normalized output pixel data after correction Y by approximated function in the merged interval and using the normalized input pixel data X for substitution.

2. The fast gamma correction method for image reading apparatus as in claim 1, wherein in step a, the 2^n intervals are combined to M merged interval by following steps:

step a0: set k=0 ;

step a1: set h=k ;

step a2: set=k+1 ;

step a3: if $k=2^n$, stop ;

step a4: if s is within (h,k), and all X_T, T=0..2^m-1, in $(G^{-1}(T_s), G^{-1}(T_{s+1}))$, are equal to all X_T, T=0..2^m-1 in $(F^{-1}_{(h,k)}(T_s), F^{-1}_{(h,k)}(T_{s+1}))$, back to step a2 ;

step a5: merging (T_h, T_{h+1})~(T_{k-1}, T_k) into (T_h, T_k), and recoding $F_{(h,k)}(.)$;

step a6: back to step a1;

wherein

m: resolution of input data

Y=G(X): realistic color correction function

$F_{(h,k)}$ (.) fitting function in interval (T_h, T_k)

3. The fast gamma correction method for image reading apparatus as in claim 1, wherein in step a, the simple fitting function is a non-transcendental function such as polynomial function or exponential function.

4. The fast gamma correction method for image reading apparatus as in claim 1, wherein image reading apparatus can be scanner, digital still camera or video camera.